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NOTICE OF ALLOWANCE AND FEE(S) DUE

2292

7590

10/08/2008

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

RUDE, TIMOTHY L.

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/08/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,305	12/28/2001	Ge Sung Chae	3449-0896PUS1	2901

TITLE OF INVENTION: LIQUID CRYSTAL DISPLAY DEVICE AND FABRICATING METHOD THEREOF

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	01/08/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

2292 7590 10/08/2008

BIRCH STEWART KOLASCH & BIRCH
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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/028,305 12/28/2001

Geo Sung Chae

3449-0896/PU1

2901

TITLE OF INVENTION: LIQUID CRYSTAL DISPLAY DEVICE AND FABRICATING METHOD THEREOF

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nonprovisional

NO

\$1510

\$300

\$0

\$1810

01/08/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
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RUDE, TIMOTHY L

2871

349-043000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

1

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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2292	7590	10/08/2008	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			RUDE, TIMOTHY L.	
			ART UNIT	PAPER NUMBER

2871

DATE MAILED: 10/08/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/028,305

Applicant(s)

SUNG CHAE ET AL.

Examiner

TIMOTHY RUDE

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE and amendment filed 11 September 2008.
2. ☒ The allowed claim(s) is/are 1-8,10-15,21 and 22.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/TIMOTHY RUDE/
Primary Examiner, Art Unit 2871

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 19 June 2008 and 11 September 2008 have been entered.

Claims

Claims 1, 8, 11-15, and 21 are amended. Claim 9 is canceled.

Allowable Subject Matter

Claims 1-8, 10-15, and 21-22 are allowed.

The following is an examiner's statement of reasons for allowance:

As to independent claims 1, 8, and 21, a thorough search relevant prior art of record did not disclose, alone or in combination, the LCD device or method as claimed

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comprising first, second and third metal layers are formed to have a same step shape that are symmetrical with respect to each other, the second metal layer extends beyond edges of the first semiconductor layer, the first metal layer extends only to edges of the first semiconductor layer, and the first and third metal layers do not contact each other.

Please compare and contrast 6a of Applicant's Figure 4 (prior art) with 59a1 of Applicant's invention shown in Figure 7F.

The closest prior art is Ueda et al (Ueda) USPAT 6,078,365 in view of Hibino et al (Hibino) 6,529,251 B2.

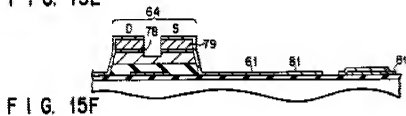
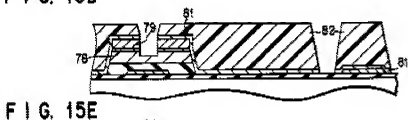
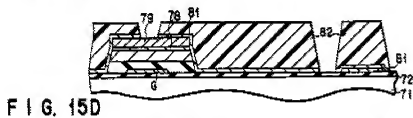
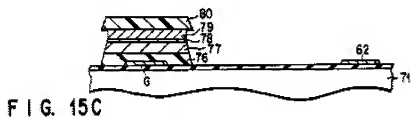
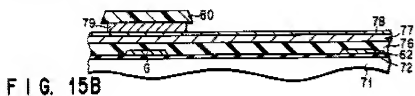
Ueda discloses a device and a method of making said device in an embodiment in Figures 15A-15F (col. 12, line 58, through col. 18, line 33, especially col. 16, line 64, through col. 18, line 33) comprising: a substrate, 71; a gate electrode, G, over the substrate; a first semiconductor layer, 77, over the gate electrode; a second semiconductor layer, 78, over the first semiconductor layer and having a defined outer edge, source, S, and drain, D, electrodes (Applicant's first metal layer) on the second semiconductor layer, the first metal layer patterned in a same pattern as the second semiconductor layer such that the first metal layer and second semiconductor layer define the channel (Applicant's separation region for exposing some surfaces of the first semiconductor layer). Please note that this is by way of only one photolithography pattern per Figures (Applicant's patterned in the same pattern).

Please note, Applicant's present amendment limitations drawn to "source and drain electrodes having a first portion overlapping with over the first metal layer and the second semiconductor layer to define a first upper portion of the separation region that abuts the lined up outer edges of the first and second semiconductor layers, and a second portion overlapping with the substrate around the gate electrode, wherein ..."

are considered met by the structure resulting from the method of the combination of applied prior art. If Applicant does not agree, a restriction will be required.

Ueda further discloses the use of source, S, and drain, D, comprised of Aluminum and Molybdenum disposed on Molybdenum (Mo/Al/Mo) (comprises Applicant's electrodes over the first metal layer), the source and drain electrodes patterned the same as the first metal layer and having a defined outer edge and the second semiconductor layer (col. 17, lines 22-42) define first upper portion of the separation region, and the source and drain electrodes include a second (Al) and a third (Mo) metal layer, in order to use a low resistance metal such as Aluminum for improved conductivity of the circuit components (col. 17, line 55, through col. 18, line 5).

The outer defined edges of the metal layers and silicon layers are all lined up and abut each other to define the channel as illustrated.



Ueda discloses (col. 12, line 58, through col. 18, line 33, especially col. 16, line 64, through col. 18, line 33) the method of forming a liquid crystal display device, comprising: forming a gate electrode on a substrate; forming an active layer over the gate electrode; forming a first semiconductor layer over the active layer; forming a second semiconductor layer over the first semiconductor layer; forming a first metal layer over the second semiconductor layer patterning the first metal layer and the second semiconductor layer in a same pattern; and forming a source electrode and a drain electrode over the first metal layer.

The outer defined edges of the metal layers and silicon layers are all lined up and abut each other to define the channel as illustrated.

Hibino teaches the use of a method including the steps of wet etching followed by dry etching [col. 13, lines 28-65] to reduce defects [col. 4, lines 21-30] and improve uniformity of TFT properties [col. 14, lines 1-10]. Please note that this would preclude unwanted TFT defects (non-uniform TFTs) which include defective TFTs with unwanted high leakage current. Hibino uses the wet etched second source electrode layer [upper layer(s)] as a barrier layer(s) [Applicant's mask] during dry etching of the layer that lie beneath [col. 13, lines 31-58].

Applicant's admitted prior art (APA) is also relevant.

APA discloses a conventional liquid crystal display device and the method of making said device in Figures 1-5 and Specification pages 1-5, comprising: a substrate,

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1; a gate electrode, 3, over the substrate; a first semiconductor layer, 15, over the gate electrode; a second semiconductor layer, 17, over the first semiconductor layer, source, 5, and drain, 7, electrodes (Applicant's first metal layer) on the second semiconductor layer, the first metal layer patterned in a same pattern as the second semiconductor layer such that the first metal layer and second semiconductor layer define the channel, 30 (Applicant's separation region) per Figure 3C (specification page 3, lines 28-31). Please note that this is well known in the art to take only one photolithography pattern (Applicant's patterned in the same pattern).

However, no reference with proper motivation to combine was found to teach the claimed device or method comprising first, second and third metal layers are formed to have a same step shape that are symmetrical with respect to each other, the second metal layer extends beyond edges of the first semiconductor layer, the first metal layer extends only to edges of the first semiconductor layer, and the first and third metal layers do not contact each other.

Dependent claims are allowable due to their dependence upon allowed claims above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any references cited but not applied are relevant to the instant Application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY RUDE whose telephone number is (571)272-2301. The examiner can normally be reached on Increased Flex Time Program.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nelms C. David can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

tir

/TIMOTHY RUDE/
Examiner, Art Unit 2871